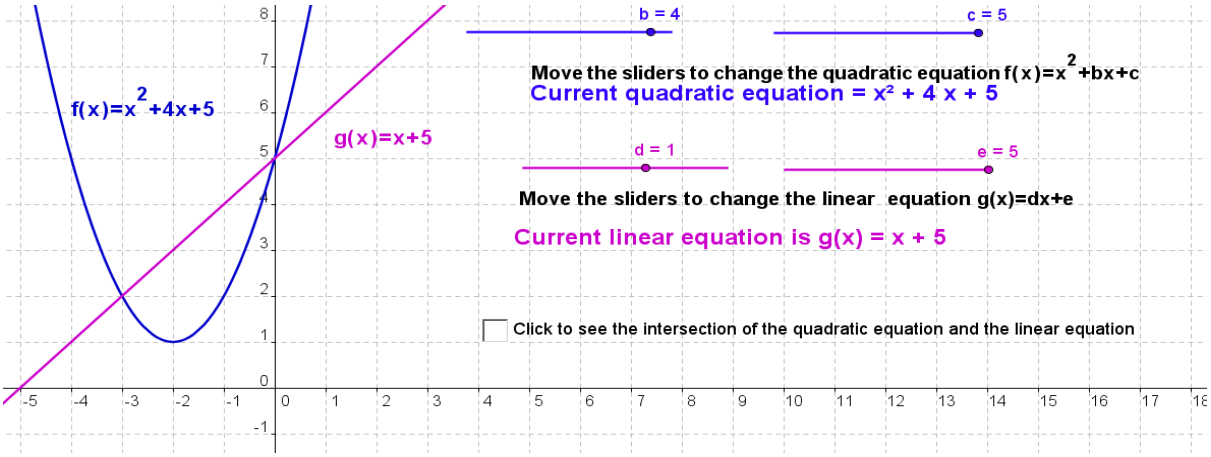
Student Activity: To solve a linear and a quadratic equation using tables, graphs and algebraic methods

Use in connection with the interactive file, 'Linear and Quadratic', on the Student's CD.



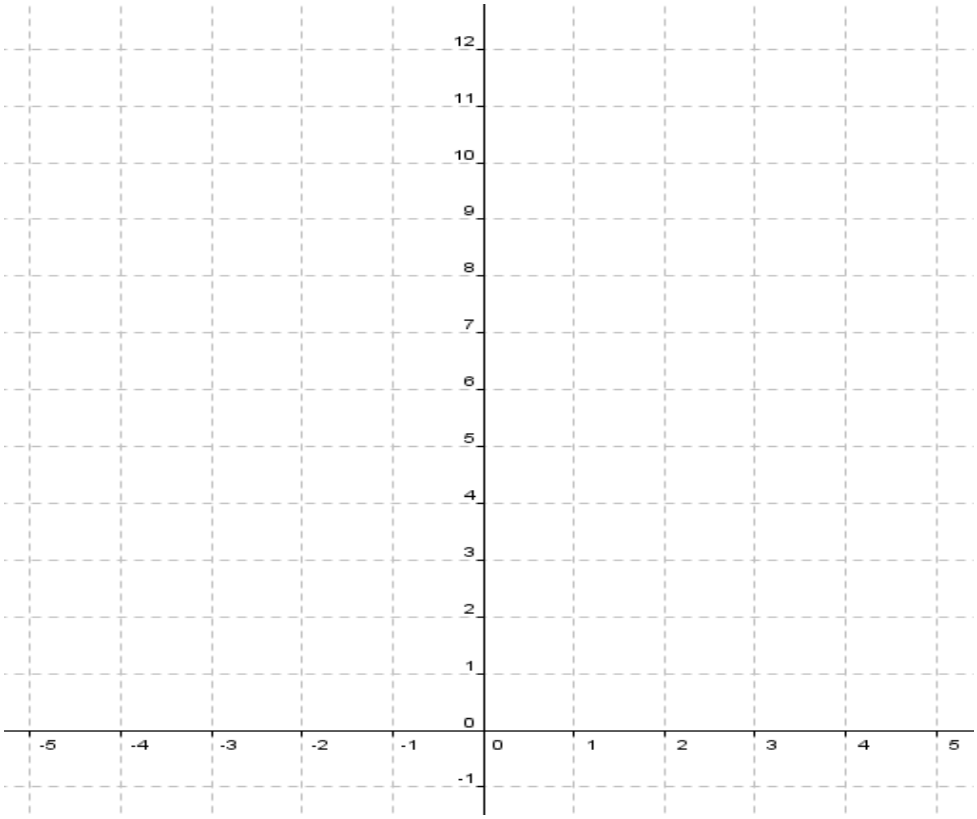
1.

a. Complete the following tables:

x	x^2	$3x$	2	$f(x) = x^2+3x+2$
−4				
−3				
−2				
−1				
0				
1				
2				

x	$g(x) = x+5$
−3	
−2	
−1	
0	
1	
2	

b. Use the information obtained in the table above draw a graph of $f(x) = x^2+3x+2$ in the domain $-4 \leq x \leq 2$.



c. Draw a graph of $g(x) = x+5$ in the domain $-3 \leq x \leq 2$ using the same axis and scale as f(x) above.

d. From both of the tables above, are there any value(s) of x for which $f(x) = g(x)$? If so what are these value(s)?

_____

e. From the graph above, are there any value(s) of x for which $f(x) = g(x)$? If so what are these value(s)?

_____

f. Hence list the solution(s) of $f(x) = g(x)$?

_____

g. Solve $f(x) = g(x)$ algebraically.

_____

_____

_____

_____

_____

h. Did your algebraic solution(s) equal the graphically solution(s)?

_____

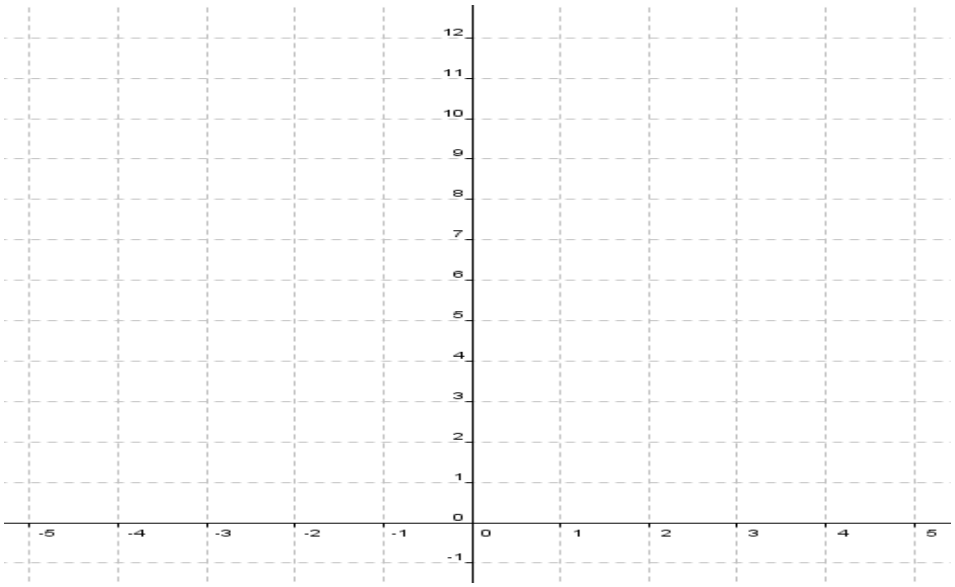
2.

a. Complete the following tables:

x	x^2	$4x$	5	$f(x)=x^2+4x+5$
-4				
-3				
-2				
-1				
0				
1				

x	$g(x)= -x-1$
-4	
-3	
-2	
-1	
0	
1	
2	

b. Use the information obtained in the table above to draw a graph of $f(x) = x^2+4x+5$ in the domain $-4 \leq x \leq 1$.



c. Draw a graph of g(x) = − x−1 in the domain $-4 \leq x \leq 2$ using the same axis and scale as f(x) above.

d. From both of the tables above, are there any value(s) of *x* for which f(x) =g(x)? If so what are these values?

_____

e. From the graph above, are there any value(s) of *x* for which f(*x*) = g(*x*) and if so what are these value(s)?

_____

f. Hence what is the solution of f(*x*) =g(*x*)?

_____

g. Solve f(*x*) =g(*x*) algebraically.

_____

_____

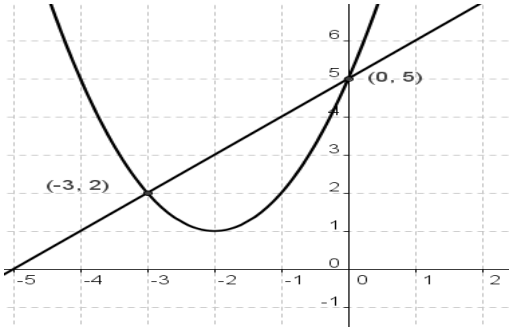
_____

_____

h. Did your algebraic solution(s) equal the graphical solution(s)?

_____

3. Given that the diagram below represents f(*x*) = x^2 +b*x* +c and g(*x*) = d*x*+e, find b, c, d and e.

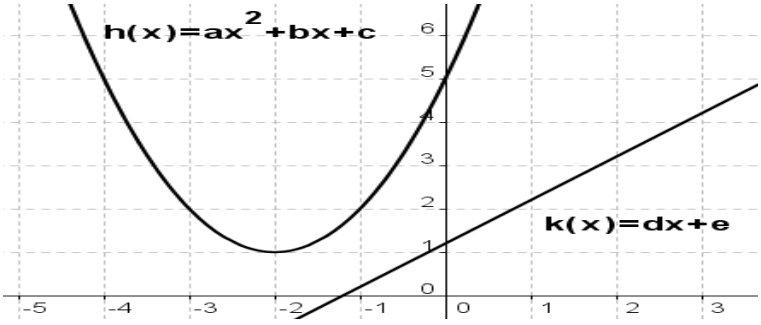


_____

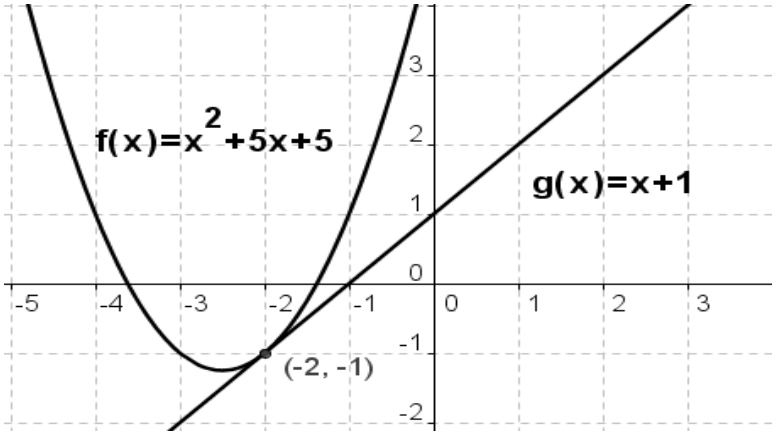
_____

_____

4. Given h(*x*) = x^2 +b*x* +c and k(*x*) = d*x* +e, is there any solution to f(*x*) = g(*x*)? Explain your answer.

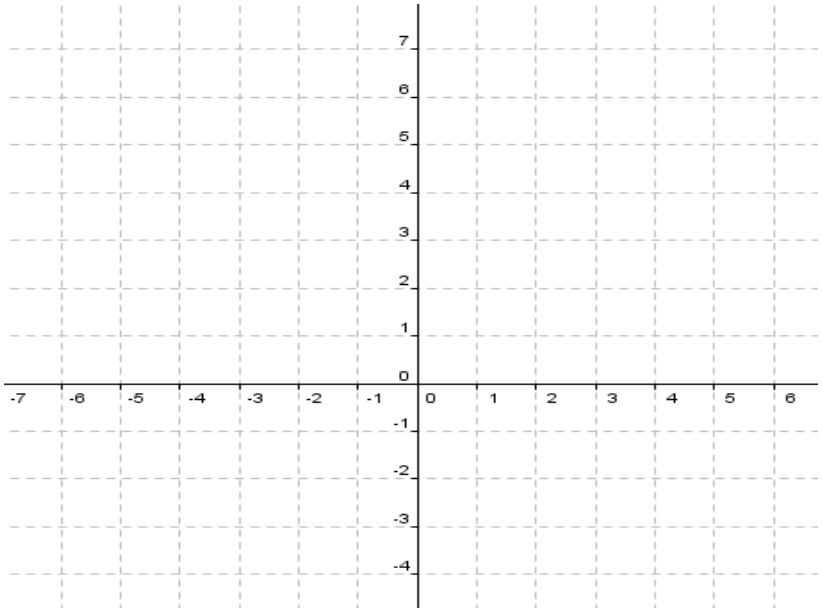


5. From the diagram below what is the solution(s) of f(x) = g(x).



_____

6. Using the interactive file solve f(x) = g(x) where f(x) = x^2 +4x+5 and g(x) = −x+1. Draw a rough sketch below.



7. Using the information obtained in the above question solve the following set of simultaneous equations $y = x^2+4x+5$ and $x+y-1 = 0$.

_____

_____

_____

Challenge

8. Given the length of a rectangular kitchen is half the square of its width and its perimeter is 48 m, find the dimensions of the kitchen.

_____

_____